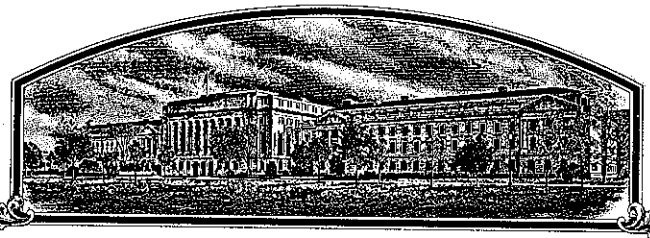

No. 9100117

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Busch Agricultural Resources, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF eighteen YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

BARLEY

'B1614'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of* Washington, D.C. *this* 30th *day of* April *in the year of our Lord one thousand nine hundred and* ninety-three.

Attest:

Kenneth Evans

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

FORM APPROVED: OMB 0581-0055, Expires 1/31/91

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) *(as it is to appear on the Certificate)*
Busch Agricultural Resources Inc.

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NO.
6B86-3016

3. VARIETY NAME
B1614

4. ADDRESS *(street and no. or R.F.D. no., city, state, and ZIP)*
3515 East County Road 52
Ft. Collins, CO 80524

5. PHONE *(Include area code)*
(303) 221-5622

FOR OFFICIAL USE ONLY

PVPO NUMBER
9100117

FILING
Date: Feb. 19, 1991
Time: ☐ A.M. ☐ P.M.

FEES RECEIVED
Filing and Examination Fee: $2150.-
Date: Feb. 19, 1991
Certificate Fee: $250.-
Date: Mar. 26, 1993

6. GENUS AND SPECIES NAME
Hordeum vulgare

7. FAMILY NAME *(Botanical)*
Gramineae

8. CROP KIND NAME *(Common Name)*
Spring Barley

9. DATE OF DETERMINATION
~~1985~~ 1985

10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION *(Corporation, partnership, association, etc.)*
Corporation

11. IF INCORPORATED, GIVE STATE OF INCORPORATION
Delaware

12. DATE OF INCORPORATION
1/1/81

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS
Duane D. Teehee
or
Dr. Mike Bjarko
Busch Agricultural Resources Inc.
3515 East County Road 52
Ft. Collins, CO 80524
(303) 221-5622

PHONE *(Include area code)*:

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED *(Follow INSTRUCTIONS on reverse)*

a. ☒ Exhibit A, Origin and Breeding History of the Variety.
b. ☒ Exhibit B, Novelty Statement.
c. ☒ Exhibit C, Objective Description of Variety.
d. ☒ Exhibit D, Additional Description of Variety.
e. ☒ Exhibit E, Statement of the Basis of Applicant's Ownership.
h. Exhibit F, Agronomic & Quality data
f. ☒ Seed Sample (2,500 viable untreated seeds). Date Seed Sample mailed to Plant Variety Protection Office 11 Feb 1991.
g. ☒ Filing and Examination Fee ($2,150) made payable to "Treasurer of the United States."

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? *(See section 83(a) of the Plant Variety Protection Act.)*
☒ YES *(If "YES," answer items 16 and 17 below)* ☐ NO *(If "NO," skip to item 18 below)*

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
☒ YES ☐ NO

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?
☒ FOUNDATION ☒ REGISTERED ☒ CERTIFIED

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?
☐ YES *(If "YES," through* ☐ Plant Variety Protection Act ☐ Patent Act. Give date: _____ .)
☒ NO

19. HAS THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?
☐ YES (If "YES," give names of countries and dates)
☒ NO

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in section 41, and is entitled to protection under the provisions of section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT *(Owner(s))*	CAPACITY OR TITLE	DATE
Duane D Teehee	Purity + Multiplication Mgr	8 February 1991
SIGNATURE OF APPLICANT *(Owner(s))*	CAPACITY OR TITLE	DATE

EXHIBIT A

Origin and Breeding History of B1614

EXPERIMENTAL LINE NUMBER: **6B86-3016**

PEDIGREE: **MOREX//PARK/CODE-X/3/ROBUST**

DATE OF CROSS: Park and Code-X were crossed in the spring of 1980; the F1 seed was crossed with Morex in the fall 1980 greenhouse; Robust was the third cross in the fall of 1982. The F1 seed was stored until 1984.

HISTORY: F1 seed bulked and grown in Spring 1984 greenhouse. F2 seed grown at Crystal, North Dakota. A single seed from an F2 selection was advanced to the F3 by single seed descent in the spring 1985 greenhouse. An F4 head row derived from the F3 plant was selected in Climax, Minnesota, 1985. Malting quality tests on remnant F4 head row seed assisted in the selection of an F5 seed increase plot that was grown in the 1985-86 winter nursery at Yuma, Arizona. The Arizona increase plot was harvested, bulk threshed, and entered in first year yield trials grown at Moorhead and Climax, Minnesota, Spring 1986, as an F2 derived F6 bulk, under the experimental line number 6B86-3016.

This line was advanced to second year yield trials in 1987 and grown at three upper midwest locations. From 1988-1990 it has been grown in third year and advanced yield trials at four upper mid-west locations. It was given the name B1614 in 1991. B1614 was also tested in the 1990 Mississippi Valley Barley Nursery in the midwestern barley growing states of Minnesota, North and South Dakota, Iowa, Michigan, Nebraska, Wisconsin, and the Canadian Provinces of Manitoba, and Saskatchewan. And it was tested in state run trials in 1990 at North Dakota State University and the University of Minnesota.

B1614 is uniform and stable. Purification of B1614 was initiated in 1988 with 60 head rows being grown at Berthoud, Colorado of which 52 rows were selected and bulked for breeder seed (six of the eight discarded rows were slightly taller, the remaining two had a tall plant). Additional selection was done in 1989 with 84 head rows grown of which 84 were selected (no discard) and bulked for breeder seed and in 1990 where 100 head rows were grown of which 92 were harvested and bulked for breeder seed (of the eight discarded rows, six had poor or weak germination, the other two had a tall plant). Future head rows will be grown as necessary to constitute breeder seed.

EXHIBIT B

NOVELTY STATEMENT

B1614 is most similar to the spring barley variety "B1603", however, it can be distinguished by the following morphological characteristics:

- B1614 has short rachilla hairs.
  B1603 has long rachilla hairs.

- B1614 has an erect juvenile growth habit.
  B1603 has semi-erect juvenile growth habit.

- Position of flag leaf at boot is 90 degree angle for B1614, and upright for B1603.

FORM APPROVED: OMB NO. 40-R3822

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK AND SEED DIVISION
BELTSVILLE, MARYLAND 20705

EXHIBIT C
(Barley)

OBJECTIVE DESCRIPTION OF VARIETY
BARLEY *(HORDEUM VULGARE)*

INSTRUCTIONS: *See Reverse.*

NAME OF APPLICANT(S)
Busch Agricultural Resources Inc.

ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)*
3515 E. County Road 52, Ft. Collins, CO 80524

FOR OFFICIAL USE ONLY
PVPO NUMBER 9100117
VARIETY NAME OR TEMPORARY DESIGNATION

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (i.e. [0][8][9] or [0][9]) when number is either 99 or less or 9 or less.

1. GROWTH HABIT:

[1] 1 = SPRING 2 = FACULTATIVE WINTER 3 = WINTER [3] Early Growth: 1 = PROSTRATE 2 = SEMIPROSTRATE 3 = ERECT

2. MATURITY (50% Flowering):

[2] 1 = EARLY (California Mariout) 2 = MIDSEASON (Betzes) 3 = LATE (Frontier)

[ ] No. of days *Earlier* than . . . . . [ ]
[02] No. of days *Later* than . . . . . [8]
1 = BETZES 2 = CALIFORNIA MARIOUT 3 = CONQUEST 4 = DICKSON 5 = PIROLINE 6 = PRIMUS 7 = UNITAN 8= Morex

3. PLANT HEIGHT (From soil level to top of head):

[3] 1 = SEMIDWARF 2 = SHORT (California Mariout) 3 = MEDIUM TALL (Betzes) 4 = TALL (Conquest)

[04] Cm. *Shorter* than . . . . . [8]
[ ] Cm. *Taller* than . . . . . [ ]
1 = BETZES 2 = CALIFORNIA MARIOUT 3 = CONQUEST 4 = DICKSON 5 = PIROLINE 6 = PRIMUS 7 = UNITAN 8= Morex

4. STEM:

[2] Exertion *(Flag to spike at maturity)*: 1 = 0 - 3 cm. 2 = 3 - 10 cm. 3 = 10 - 15 cm.
[1] Anthocyanin: 1 = ABSENT 2 = PRESENT

[05] NO. OF NODES (Originating from node above ground)

[1] Collar Shape: 1 = CLOSED 2 = V-SHAPED 3 = OPEN 4 = MODIFIED CLOSED OR OPEN
[3] Shape of Neck: 1 = STRAIGHT 2 = SNAKY 3 = OTHER (Specify) slightly snaky

5. LEAF:

[1] Basal leaf sheath *(seedling)*: 1 = GLABROUS 2 = PUBESCENT
[3] Position of flag leaf *(at boot stage)*: 1 = DROOPING 2 = UPRIGHT 3= 90 deg
[2] Waxiness: 1 = ABSENT (Glossy) 2 = SLIGHTLY WAXY 3 = WAXY
[30] MM. WIDTH (First leaf below flag leaf)
[22] CM. LENGTH (First leaf below flag leaf)
[1] Anthocyanin in leaf sheath: 1 = ABSENT 2 = PRESENT

6. HEAD:

[2] Type: 1 = TWO-ROWED 2 = SIX-ROWED
[4] Density: 1 = LAX 2 = ERECT (Not dense) 3 = ERECT (Dense) 4= mid-dense
[2] Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE 4 = OTHER (Specify) _____
[2] Waxiness: 1 = ABSENT (Glossy) 2 = SLIGHTLY WAXY 3 = WAXY
[3] Lateral Kernels Overlap: 1 = NONE 2 = AT TIP 3 = 1/4 - 1/2 OF HEAD
[3] Rachis *(Hair on edge)*: 1 = LACKING 2 = FEW 3 = COVERED

7. GLUME:

[3] Length: 1 = 1/3 OF LEMMA 2 = 1/2 OF LEMMA 3 = MORE THAN 1/2 OF LEMMA
[2] Hairs: 1 = NONE 2 = SHORT 3 = LONG
[4] Hair covering: 1 = NONE 2 = RESTRICTED TO MIDDLE 3 = CONFINED TO BAND 4 = COMPLETELY COVERED
[3] Awns: 1 = LESS THAN EQUAL TO LENGTH OF GLUMES 2 = EQUAL TO LENGTH OF GLUMES 3 = MORE THAN EQUAL TO LENGTH OF GLUMES
[3] Awn Surface: 1 = SMOOTH 2 = SEMISMOOTH 3 = ROUGH

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8. LEMMA:

[5] Awn: 1 = AWNLESS 2 = AWNLETS ON CENTRAL ROWS, AWNLESS ON LATERAL ROWS
3 = SHORT ON CENTRAL ROWS, AWNLETS ON LATERAL ROWS 4 = SHORT (less than equal to length of spike)
5 = LONG (longer than spike) 6 = HOODED

[4] Awn Surface: 1 = AWNLESS 2 = SMOOTH 3 = SEMISMOOTH 4 = ROUGH

[3] Teeth: 1 = ABSENT 2 = FEW 3 = NUMEROUS

[1] Hair: 1 = ABSENT 2 = PRESENT

[3] Shape of base: 1 = DEPRESSION 2 = SLIGHT CREASE 3 = TRANSVERSE CREASE

[1] Rachilla Hairs: 1 = SHORT 2 = LONG

9. STIGMA:

[2] Hairs: 1 = FEW 2 = MANY

10. SEED:

[2] Type: 1 = NAKED 2 = COVERED

[1] Hairs on Ventral Furrow: 1 = ABSENT 2 = PRESENT

[3] Length: 1 = SHORT (8.0 mm.) 2 = SHORT TO MIDLONG (7.5 - 9.0 mm.) 3 = MIDLONG (8.5 - 9.5 mm.)
4 = MIDLONG TO LONG (9.0 - 10.5 mm.) 5 = LONG (10.0 mm.)

[2] Wrinkling of hull: 1 = NAKED 2 = SLIGHTLY WRINKLED 3 = SEMIWRINKLED 4 = WRINKLED

[1] Aleurone Color: 1 = COLORLESS (White or Yellow) 2 = BLUE

[0][1] PERCENT ABORTIVE

[3][9] GMS. PER 1000 SEEDS

11. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

[0] SEPTORIA	[0] NET BLOTCH	[0] SPOT BLOTCH	[0] POWDERY MILDEW
[0] LOOSE SMUT	[0] BACTERIAL BLIGHT	[0] COVERED SMUT	[0] FALSE LOOSE SMUT
[0] STEM RUST	[0] LEAF RUST	[0] SCAB	[0] SCALD
[0] AY	[0] BSMV	[0] BYDV	[0] OTHER (Specify)

12. INSECT: (0 = Not tested, 1 = Susceptible, 2 = Resistant)

[0] GREEN BUG	[0] ENGLISH GRAIN APHID	[0] CHINCH BUG	[0] ARMYWORM
[0] GRASS HOPPERS	[0] CEREAL LEAF BETTLE	[0] OTHER (Specify) _____	

HESSIAN FLY RACES: [ ] GP [ ] A [ ] B [ ] C [ ] D [ ] E [ ] F [ ] G

13. CHEMICAL (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

[0] DDT [0] OTHER (Specify) _____

14. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	B1603	Seed size	B1603
Leaf size	B1603	Coleoptile elongation	B1603
Leaf color	B1603	Seedling pigmentation	B1603
Leaf carriage	B1603		

REFERENCES: The following publications may be used as a reference aid for the standardization of character descriptions and terms used in this form:

1. Wiebe, G. A., and D. A. Reid, 1961, Classification of Barley Varieties Grown in the United States and Canada in 1958, Technical Bulletin No. 1224, U.S. Dept. of Agriculture.
2. Reid, D. A., and G. A. Wiebe, 1968, Barley: Origin, Botany, Culture, Winter Hardiness, Genetics, Utilization, Pests, Agriculture Handbook No. 338, U.S. Dept. of Agriculture. pp. 61 - 84.
3. Malting Barley Improvement Association, Milwaukee, Wisconsin, 1971, Barley Variety Dictionary.

COLOR: Nickerson's or any recognized color fan may be used to determine color of the described variety.

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EXHIBIT D

ADDITIONAL BOTANICAL DESCRIPTION OF B1614

B1614 is a six-rowed spring barley developed by Busch Agricultural Resources, Inc. It has midseason maturity and excellent malting quality.

Juvenile growth habit is erect. Plant color at boot is green with a flag leaf that holds itself at a 90 degree angle from the stem. Head shape is strap and middense with a slightly snakey neck and closed collar. Rachilla and glume hair is short and the rachis edge is completely covered. Glumes are covered with hair and glume awns are more than equal to glume length. Lemma awns are long and rough. Lemma teeth are numerous and hairs are absent. Seed is covered, midlong, slightly wrinkled and aleurone is colorless.

B1614 is a six-rowed variety well adapted to the upper midwestern barley producing areas of North and South Dakota, Minnesota, and Wisconsin.

EXHIBIT E

STATEMENT OF THE BASIS OF APPLICANT'S OWNERSHIP

Busch Agricultural Resources, Inc. is the applicant for protection in this case being:

a. The incorporated business registered in Delaware for and within which regular employees have bred B1614.

b. The proprietary owner and intending commercial seller of B1614.

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EXHIBIT F

QUALITY AND AGRONOMIC DATA

AGRONOMIC SUMMARY

	Yield % Morex					
Variety	(2) 86	(3) 87	(2) 88	(8) 89	(5) 90	(20) AVG
B1614	121	114	115	109	101	110
Morex	100 (66)	100 (85)	100 (52)	100 (82)	100 (66)	100 (74)
Robust	108	109	111	106	103	106

Variety	(15) HEAD 1/1	(13) HT CM	(7) LDG 1-9	(5) MAT 1-3	(11) AWN 1-5	(5) TEST WT
B1614	179	84	1.9	3.1	4.8	45.8
Morex	177	88	4.0	1.8	1.0	45.2
Robust	179	87	3.0	2.9	1.1	45.4

1986-1990 data, () = station years

QUALITY SUMMARY

Variety	(5) % Plump	(10) Malt Prot	(10) F. Grd	(7) F-C Dif	(7) WORT Vis	(10) S/T
B1614	83.1	13.3	78.9	1.8	1.43	44.7
Morex	73.7	13.1	78.9	1.7	1.39	42.4

Variety	(10) Sol Prot	(10) DP	(10) AA	WORT (5) CLR	WORT (7) TUR
B1614	6.1	176	46.8	2.0	10
Morex	5.7	172	51.0	1.9	11

1986-1990 data, () = station years